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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Min-Seok Song

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EXAMINER

PARVINI, PEGAH

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/597,841	Applicant(s) SONG ET AL.	
	Examiner PEGAH PARVINI	Art Unit 1731	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 March 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 16-24, 26 and 28-37 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 16, 17, 20, 21 and 28-37 is/are rejected.
- 7) ☒ Claim(s) 18-19, 21-24 and 26 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 August 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

This Office action is in response to the RCE/amendment filed 3/15/2010. After entry of this response, claims 16-24, 26 and 28-37 are currently pending in this application.

Specification

The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: Instant claim 17 recites “wherein the concave portion includes a dimple type one **and** a groove type one”; whereas, the specification provides support for “the concave portion may include a dimple type concave portion **or** a groove type concave portion.” in paragraph [19] page 5.

Claim Objections

Claim 21 is objected to because of the following informalities: in the statement “the plurality of concave portion” there is a need to a “s” at the end of “portion”. Also, “comprises” need to be replaced with “comprise”. Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 21 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

A close look at the instant invention and especially the figures (e.g. Fig. 11 and 12) reveals that the through-holes are in a *convex* portion of the tool not in a concave portion; thus, it is not clear as what is meant by “a through-hole type **concave** portion formed in a sub-cutting face of the shank”.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 16-17, and 28-37 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,007,207 to Phaal.

Regarding claims 16 and 30, Phaal teaches a tool insert comprising an abrasive compact bonded to a cemented carbide support (i.e. shank or substrate). A plurality of circular concentric recesses each filled with abrasive compact material, extend into the cemented carbide support from the compact/carbide interface (Abstract, Figures 1 and 5-6). Figure 1 clearly demonstrate concave portions in a shank or support which are

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filled with abrasive materials wherein the abrasive materials, also, cover the topmost surface of the shank or support.

As evidenced from the reference, there are multiple abrasive layers filling up the concave portions of the tool and the top surface of the shank or support. Thus, it is obvious and evidenced that one or more of such layers which are closer to the bottom of the concave portions and have filled them are to be considered as “first portion of the plurality of abrasives” and the layers on the top of them are to be considered as “second portion of the plurality of the abrasives”. It is to be noted that there is no distinction between the first and the second portions as claimed instantly; in fact, each portion comprises a plurality of abrasives “a first portion of the plurality of abrasives” and “a second portion of the plurality of abrasives”. Therefore, the existence of multiple layers of abrasive materials would make the multiple abrasive layers of instant claims obvious.

The layers on the topper surface are considered upper abrasive layers.

Regarding claim 17, the concave portion clearly is groove type. Also, this is seen to read on the limitation of instant claim 17 especially in view of the fact that “dimple”, by definition, mean slight depression, and the concave portions of said figures meet the definition of dimple absent evidence to the contrary.

Regarding claim 28, the reference is drawn to cutting, milling, grinding, drilling and other abrasive operations (column 1, lines 5-10).

Regarding claim 29, the reference teaches that the abrasive could be cubic boron nitride or diamond, and the disclosure of diamond is taken to read on any type of diamond including natural diamond (column 2, lines 44-55).

Regarding claims 31-37, the upper most layer of abrasive compact extends above the top surface of the support (i.e. shank or body) as shown in Figures 1 and 5-6, and this upper most layer is clearly higher than a top of the lower abrasive layer; in other words, it protrudes above a top of the lower abrasive layer. It is to be noted that as evidenced from figures, the topmost surface of the shank is disposed between one of the plurality of concave portions and another one of the plurality of concave portions adjacent to the one of the plurality of concave portions.

Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Phaal as applied to claim 16 above, in view of U.S. Patent No. 4,091,792 to Farrell.

Phaal, as noted above, disclose a tool insert having a body with concave portions wherein the concave portions, and in fact, the top of the tool, including the topmost surface of the body are filled and/or covered with abrasive compact comprising abrasive particles such as diamond wherein the abrasive compact also covers the top of the body or shank as detailed out above.

Although Phaal may not expressly disclose through-hole within the concave portion, it has been known, and thus, obvious to a person of ordinary skill in the art to have through-holes formed in abrasive tools since they assist in dissipating the heat

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generated during grinding/abrading work as that evidenced by Farrell (column 1, lines 33-42) as clearly known in the art.

Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Phaal as applied to claim 16 above, in view of Farrell and U.S. Patent No. 4,624,237 to Inoue.

Phaal, as noted above, disclose a tool insert having a body with concave portions wherein the concave portions, and in fact, the top of the tool, including the topmost surface of the body are filled and/or covered with abrasive compact comprising abrasive particles such as diamond wherein the abrasive compact also covers the top of the body or shank as detailed out above.

Additionally, as shown above, Phaal in view of Farrell makes it obvious to have through-holes within the concave portions in order to assist in dissipating the heat generated during grinding/abrading work. It should be noted that the concave portion is in the sub-cutting face of the support material (i.e. shank) as that evidenced by Phaal.

The combination does not expressly disclose the existence of *grooves in a main cutting edge*. Although Phaal makes it obvious that his tool is used in cutting, grinding, and similar operations, it does not expressly teach a structure of devices used for said purposes with grooves in the main cutting edges. Nevertheless, the formation of grooves onto an abrading wheel would have also been obvious to a person of ordinary skill in the art motivated by the fact that grooves would help in, not only dissipating the heat generated by the grinding/abrading work and thus cooling the tool, but also, they provide a passage for the outflow of the abraded particles as that shown by Inoue

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(Abstract and claim 1). In addition, as it is clear from Figures 1 and 3 of Inoue, abrasives are bonded into grooves as well (Figures 1 and 3, Inoue). It is, also, to be noted that “grooves” clearly fall into “concave” type shapes.

Therefore, the combination of Phaal in view of Farrell and further in view of Inoue discloses that it would be obvious to have groove-type concave portions formed in a main cutting face of the shank or body.

Response to Arguments

Applicant's arguments with respect to claims 16-18, 20-21, and 28-37 have been considered but are moot in view of the new ground(s) of rejection.

Allowable Subject Matter

Claims 18-19, 22-24 and 26 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: The prior art do not disclose or suggest a diamond tool wherein a cross section of the concave portion taken along a direction perpendicular to the surface of the shank including a semicircular shape, a semi-elliptic shape, a U-shape, a V-shape, or a wavy shape wherein the tool also meet the limitations recited in instant claim 16. Furthermore, the prior art do not disclose or suggest a diamond tool wherein the wall between the concave portions has a rounded upper end edge wherein the tool, also, meets the

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limitations recited in instant claim 16. Additionally, the prior art do not suggest or teach a diamond tool wherein a ratio (s/w) of the spacing (s) between the concave portions to the width (w) of the concave portions is within a range of 0.2 to 0.8 or that a ratio (w/a) of the width (w) of the concave portion to the maximum diameter (a) of the abrasive is greater than 0.25, or a ratio (d/a) of the depth of the concave portion to the maximum diameter (a) of the abrasive is greater than 0.25 and wherein the tool, also, meet the limitations recited in instant claim 16. In addition, the prior art do not disclose or suggest a diamond tool wherein a height of the second portion of the plurality of abrasives is varied and wherein the tool meets the limitations recited in instant claim 16.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to PEGAH PARVINI whose telephone number is (571)272-2639. The examiner can normally be reached on Monday to Friday 8:00am-4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jerry Lorengo can be reached on 571-272-1233. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Pegah Parvini/
Examiner, Art Unit 1731